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EXAMINER	
RUGGLES, JOHN S	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/608,639	KANG ET AL.	
	Examiner	Art Unit	
	John Ruggles	1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *29 February 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *2-12 and 14-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *2-12 and 14-20* is/are rejected.

7)☒ Claim(s) *2-12 and 14-20* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *29 August 2005* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

In the current 2/29/08 amendment filed by Applicants, claims 1 and 13 remain as previously cancelled, claims 2-5, 12, 15, 17-19 remain as previously presented, *claims 6-7, 11, 14, 16, and 20* are *currently amended*, and claims 8-10 remain as original. Therefore, only claims 2-12 and 14-20 remain under consideration as currently amended.

Revised objections to the drawings and claims are presented below.

The previous rejections of the claims under the second paragraph of 35 USC 112 are also set forth below in revised form, as necessitated by the current amendment.

The previous art rejections of the claims under 35 USC 102/103 and 103 are revised below, in response to the current amendment and accompanying remarks.

Responses to Applicants' current arguments are presented after the first rejection or objection to which they are directed. Rejections or objections of the previous Office action not found below are withdrawn in view of the current amendment and accompanying remarks.

Drawings

(i) The drawings (e.g., Figure 3A, Figures 5A-5C, etc.) are objected to (e.g., as failing to comply with 37 CFR 1.84 (h), (i), (j), etc.) because they are inverted with respect to the corresponding descriptions thereof in the specification (e.g., at paragraphs [0090], [0120], etc.) and the drawings are also inverted with respect to the corresponding instant claim(s) (e.g., so that the trench *upper* surface in the drawings is described to be the trench "bottom" surface as recited by line 3 in each of the currently amended claims 14 and 16, etc.). Note that 37 CFR 1.84(h) specifically indicates that the drawings should preferably be presented in an upright position.

However, since Applicants have described these drawings in the specification and corresponding claims with directional language, Applicants must at least be consistent therewith by either (A) supplying corrected drawings that fully correspond to the directional language in the specification and claims or (B) amending the specification and claims at all applicable occurrences to correspond with the orientation of all the features that are shown in the drawings.

(ii) The drawings are also objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention as specified in the claims. Therefore, the *claimed orientation (directional language) of the phase edge phase shift mask (PEPSM) features and method of fabricating the PEPSM must be shown in the drawings* (as indicated above) or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are still required in reply to this Office action to avoid abandonment of the instant application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner,

the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Applicants' remarks on page 8 of 14 in the current amendment are not convincing with regard to the above objections of the drawings, at least because the instant drawings are not entirely consistent with the specific directional language or orientations used in the instant claims and specification, as indicated previously and now revised above.

Claim Objections

Claims 2-12 and 14-20 are objected to, because of at least the following informalities: **(2)** in each of **(a)** claim 7 lines 15-18 and **(b)** claim 14 lines 8-11, the language "the auxiliary pattern reduces an intensity of the light at areas corresponding to the auxiliary pattern only partially, and a photoresist pattern is formed at an area corresponding to an edge of the trench, and is not formed at areas corresponding to the auxiliary pattern" should be changed to --the auxiliary pattern reduces an intensity of the light at ~~areas~~ an area corresponding only partially to the auxiliary pattern ~~only partially~~, and a photoresist pattern is formed at an area corresponding to an edge of the trench, and a photoresist pattern is not formed at ~~areas~~ an area corresponding to the auxiliary pattern--, in order to be consistent with other language in each of these claims at the applicable occurrences. Similarly, **(2) (c)** in claim 16 lines 8-11, the language "the auxiliary pattern reduces an intensity of the light at areas corresponding to the auxiliary pattern only partially, and a photoresist pattern is formed at an area corresponding to an edge of the trench, and is not formed at areas corresponding to the auxiliary pattern" should be changed to --the auxiliary pattern reduces an intensity of the light at areas corresponding only partially to the auxiliary pattern ~~only partially~~, and a photoresist pattern is formed at an area corresponding to an

edge of the trench, and a photoresist pattern is not formed at areas corresponding to the auxiliary pattern--, in order to be consistent with other language in this claim. Claims 2-6 and 15 depend from claim 14, claims 8-12 depend from claim 7, and claims 17-20 depend from claim 16. Appropriate correction is still required.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter, which the applicant regards as his invention.

Claims 2-12 and 14-20 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter, which applicant regards as the invention.

In each of **(1)** claim 7 lines 14-15, **(2)** claim 14 lines 7-8, and **(3)** claim 16 lines 7-8, the phrase "the mask is used to pattern a photoresist layer by passing light therethrough" is not fully clear in each of these claims about whether the light is passed (A) through the mask or (B) through the photoresist. However, for the purpose of this Office action, this phrase has been interpreted in each of claims 7, 14, and 16 to mean --the mask is used for passing light therethrough to pattern a photoresist layer ~~by passing light therethrough~~--, in accordance with (A) above (to produce a light intensity curve B2, as shown by instant Figure 3B, which is described in the specification at paragraph [0095]), as well as to improve clarity. It is also not fully clear how this intended use or functional language further limits the actual structure of the claimed phase edge phase shift mask (PEPSM) or the claimed method of fabricating the PEPSM. Accordingly, for the purpose of this Office action and in order to expedite prosecution of this application, the above intended use or functional language in claims 7, 14, and 16 is not

considered to substantially further limit the actual claimed PEPSM structure or method of fabricating the PEPSM. Claims 8-12 depend from claim 7, claims 2-6 and 15 depend from claim 14, and claims 17-20 depend from claim 16.

Claim Rejections - 35 USC § 102, 102/103, or 103

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 2-5, 7-10, 12, and 14-15 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Ham (US 5,567,552).

Ham teaches a (phase edge) phase shift mask (PEPSM, Figure 2, c2/L60-63, c4/L3-14) and a method of fabricating such a PEPSM (abstract, Figures 1A-1F, c2/L13-59). As shown in front page Figure 2, the PEPSM 10 has a transparent quartz substrate 1 in which is etched grooves or trenches 3 of width B constituting 180° phase shift regions separated by an unetched transparent 0° region of width A, wherein each trench 3 has a sidewall surface 3A and a bottom surface extending therefrom. An opaque chrome (Cr) auxiliary pattern 5B is formed at the center of each trench bottom surface by coating Cr and etching back to leave only the desired portion of

Cr. When this PEPSM is used for passing light therethrough to pattern a photoresist layer, the auxiliary pattern 5B is shown to reduce an intensity of light at an area corresponding only partially to the auxiliary pattern 5B (e.g., corresponding only partially to an area across the bottom of each trench having a width B and only partially across the width of each auxiliary pattern 5B on the PEPSM, etc., as illustrated in Figure 2 of Ham). Therefore, Ham's PEPSM is considered to be inherently capable and fully suitable for forming a photoresist pattern at an area corresponding to an edge of each trench while not forming a photoresist pattern at an area corresponding to a Cr opaque auxiliary pattern (which specifically reads on the PEPSM and corresponding method of fabrication recited by *instant claims 2, 4-5, 7, 9-10, 12, and 14-15*; and further encompasses the PEPSM and corresponding method of fabrication recited by *instant claims 3 and 8* for an auxiliary pattern of optical interference material that is opaque).

On pages 11-12 in the remarks section of the current amendment, Applicants rely on the current claim amendments for the intended use or the functional language of the instant PEPSM structure, rather than relying on specific structure of the PEPSM or its method of manufacture as actually recited in the instant claims. Applicants also argue differences between the instant intended light intensity (e.g., of instant Figure 3B, etc.) as compared to that shown by Ham's Figure 2.

In response, it is conceded that the intensity of light curve illustrated by instant Figure 3B is different from that illustrated by Ham's Figure 2. However, it is not instant Figure 3B that stands rejected over Ham, but rather the actual recitations of the instant claims that remain rejected over Ham. In the phase edge phase shift mask (PEPSM) of instant claim 14 and the method of fabricating the PEPSM of instant claim 7, the specific mask structure and materials, as

well as the method of making this PEPSM, are both met by Ham (as described throughout prosecution and again set forth above). In fact, Applicants have not disputed the similarity of Ham's PEPSM specific structure, materials, and steps of forming the mask to those of the instant claims. Therefore, since Ham's PEPSM (and method of fabricating it) show the same or very similar specific structure and materials as are actually recited by the instant claims, Ham's PEPSM would have been inherently capable of performing the actual recitations for the intended use or functional language of the instant claims. See MPEP § 2112 and *In re Schreiber*, 128 F.3d 1473, 44 USPQ2d 1429 (Fed. Cir. 1997). Also, see MPEP § 2173.05(g).

The arguments pursued in the remarks section of the current amendment by Applicants are what they contend to be a difference in function or intended use for the instantly claimed PEPSM over that of Ham. A recitation directed to the manner in which a claimed apparatus or mask structure is intended to be used does not distinguish the claimed mask structure from that of the prior art (Ham), if the prior art has the capability to so perform. See MPEP § 2114 and *Ex parte Masham*, 2 USPQ2d 1647 (Bd. Pat. App. & Inter. 1987).

As indicated above, the instant claims require that "when" the PEPSM "is used for passing light therethrough to pattern a photoresist layer" or a resist layer, "the auxiliary pattern reduces an intensity of the light at an area corresponding *only partially* to the auxiliary pattern" (emphasis added), so that some kind of a photoresist pattern is formed in the resist at "*an area* corresponding to an edge of the trench" (of the PEPSM, emphasis added), but a photoresist pattern is not formed at "*an area* corresponding to the auxiliary pattern" (of the PEPSM, emphasis added). This intended use or functional language as claimed does not specify exactly (a) how wide or how close to the edge of the mask trench the pattern "area" on the resist has to

be aligned with the edge of the mask trench, (b) whether the pattern is formed in the resist by light intensity that is either above or below an exposure threshold of the resist as compared to the light intensity that is either below or above the exposure threshold of the resist at the area corresponding to the auxiliary pattern on the PEPSM, (c) what kind of resist is used (e.g., positive or negative resist, etc.), nor (d) the strength of light intensity required to expose the resist (e.g., the exposure threshold of the resist, etc.).

Ham's Figure 2 illustrates that a higher light intensity is achieved through the PEPSM near the trench edge 3A (within "*an area* corresponding to an edge of the trench"), including an edge portion of each auxiliary pattern 5B, than the lower light intensity that is realized under the center portion or area of each opaque auxiliary pattern 5B (so that "the auxiliary pattern reduces an intensity of the light at an area corresponding *only partially* to the auxiliary pattern", emphasis added). Therefore, it would have been recognized by one or ordinary skill in the art that Ham's PEPSM would be inherently capable of forming a pattern in the resist at "*an area* corresponding to an edge of the trench" (of the PEPSM taught by Ham), while not forming a pattern in the resist at "*an area* corresponding to the auxiliary pattern" of this prior art PEPSM.

For at least the above reasons, it is still believed that the prior art PEPSM specific structure and method of making it taught by Ham would have been inherently capable of meeting the instant claim limitations as they are actually recited.

Claims 6 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ham (US 5,567,552) in view of Randall et al. (US 2002/0094492).

While teaching the other aspects of *instant claims 6 and 11*, Ham does not specify the line width of the opaque Cr auxiliary pattern to be 30 nm to 150 nm.

However, Cr line widths on a PSM in the instant range of 30 nm to 150 nm are well known. For example, Randall et al. teach a method of double exposure and a PSM therefore having orthogonal overlapping Cr regions (34, 36) that are each of critical dimension (CD) width (w_{34}, w_{36}) and that these CD width Cr regions are provided on both the binary (mask) **and the PSM(s)** (35, 33, emphasis added). These Cr region CD widths w_{34} and w_{36} are each specifically exemplified as being 0.2 μ (200 nm) wide (paragraph [0058] lines 4-6). Alternatively, a well-known "1X" mask having the same dimensions as those imaged on the resist for making a 0.16 μ (160 nm) wide gate electrode having a critical width includes a Cr opaque line width of 160 nm ([0004] L15-20, [0019] L7-11, [0038] L5-10,22-26, and [0055] L18-22). Furthermore, gate electrode line widths on the order of 0.15 μ (150 nm) are also contemplated ([0012] L24-27) for a corresponding PSM having a Cr opaque line width of 150 nm. It is desirable to fabricate integrated circuit device features that are as small and closely packed as possible to provide a high level of functionality and performance for the circuit, due to small feature sizes. The term "photomask" is used broadly, in reference to both 1X masks and reticles for various types of exposures [0004], [0038], as well as in reference to PSMs [0057].

It would have been obvious to one of ordinary skill in the art at the time of the invention for the PEPSM and the corresponding method of fabrication (taught by Ham) to have employed an opaque Cr auxiliary pattern having a well-known narrow line width (of e.g., 150 nm or smaller, etc., reading on the instant line width of 30 nm to 150 nm), so that the PEPSM would have features that are as small and closely packed as possible to provide a high level of functionality and performance, as taught by Randall et al., for a product (e.g., circuit device, etc.) made by patterned exposure through this PEPSM. One of ordinary skill in the art would also

recognize that narrower CD widths of opaque Cr patterns having proven utility on binary masks (e.g., the opaque Cr widths of 160nm or 150nm exemplified by Randall et al., etc., as discussed above) would reasonably be expected to have similar beneficial utility on a PSM and would therefore have been obvious as the opaque Cr auxiliary patterns at the bottom of the PS trenches in the PEPSM structure (taught by Ham), for the same reason as indicated above (*instant claims 6 and 11*).

On pages 12-14 of the current remarks, Applicants fail to give full credit to the teachings of Randall with respect to the use of narrow Cr patterns on a PSM (not just on binary masks as asserted by Applicants) in order to fabricate integrated circuit device features that are as small and closely packed as possible to provide a high level of functionality and performance for the circuit, due to small feature sizes. In fact, Randall uses the term "photomask" broadly, in reference to both 1X masks and reticles for various types of exposures [0004], [0038], as well as in reference to PSMs [0057], as indicated above. Therefore, the current arguments against the combination of Ham and Randall are not persuasive.

Claims 16-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ham (US 5,567,552) in view of either Kamon (US 6,737,198) or Steinberg et al. (US 2002/0031711).

Ham does not specifically teach an additional opaque or optical interference Cr auxiliary pattern formed at the center of the unetched transparent 0° region of width A.

Kamon teaches alternative embodiments of a PSM having etched recessed phase shifters (PS) and relatively narrow light shading, opaque, or optical interference auxiliary patterns 111 centered either at the bottom of the etched PS recesses in the substrate 10 (Figure 21G, c17/L49 to c18/L16) or on top of raised portions of the substrate 10 (Figure 22E, c18/L17-36).

Steinberg et al. teach an alternative embodiment of a multi-level PSM in Figure 9(e) having raised transparent mesas or pedestals 902 on a transparent substrate 905 and patterned opaque metal (e.g., Cr, etc.) regions 906 on both the raised 902 and recessed 905 areas of the substrate (paragraphs [0047], [0081]).

It would have been obvious to one of ordinary skill in the art at the time of the invention for the PEPSM (taught by Ham) to have employed an additional opaque or optical interference Cr auxiliary pattern (as taught by either Kamon or Steinberg et al.) formed at the center of the unetched transparent 0° region of width A (as shown in Ham Figure 2). This would be for the same reason such an opaque or optical interference Cr auxiliary pattern was used at the center of each trench bottom surface (taught by Ham) so that when this combined PEPSM (taught by Ham and either Kamon or Steinberg et al.) is used to pattern a photoresist layer, it would be inherently capable and fully suitable for forming a photoresist pattern at an area corresponding to an edge of each trench while not forming a photoresist pattern at an area corresponding to the Cr opaque auxiliary pattern or additional Cr opaque auxiliary pattern, each of which reduces an intensity of the light passing through the combined PEPSM at an area corresponding only partially to the auxiliary pattern (this reads on the PEPSM recited by *instant claims 16 and 18-19* and further encompasses the PEPSM recited by *instant claim 17* for an auxiliary pattern of optical interference material that is opaque).

Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ham (US 5,567,552) in view of either Kamon (US 6,737,198) or Steinberg et al. (US 2002/0031711), and further in view of Randall et al. (US 2002/0094492).

While teaching the other aspects of *instant claim 20*, Ham and either Kamon or Steinberg et al. do not specify the line width of the opaque Cr auxiliary pattern to be 30 nm to 150 nm.

The teachings of Randall et al. are discussed above.

It would have been obvious to one of ordinary skill in the art at the time of the invention for the PEPSM (taught by Ham and either Kamon or Steinberg et al.) to have employed an opaque Cr auxiliary pattern having a well-known narrow line width (of e.g., 150 nm or smaller, etc., reading on the instant line width of 30 nm to 150 nm), so that the PEPSM would have features that are as small and closely packed as possible to provide a high level of functionality and performance, as taught by Randall et al., for a product (e.g., circuit device, etc.) made by patterned exposure through this PEPSM for forming a photoresist pattern at an area corresponding to an edge of each trench while not forming a photoresist pattern at an area corresponding to the Cr opaque auxiliary pattern having a well-known narrow line width (that reduces an intensity of light passing through the PEPSM at an area corresponding only partially to the auxiliary pattern). One of ordinary skill in the art would also recognize that narrower CD widths of opaque Cr patterns having proven utility on binary masks (e.g., the opaque Cr widths of 160nm or 150nm exemplified by Randall et al., etc., as discussed above) would reasonably be expected to have similar beneficial utility on a PSM and would therefore have been obvious as the opaque Cr auxiliary patterns at the bottom of the PS trenches in the PEPSM structure (taught by Ham), as well as for the additional opaque or optical interference Cr auxiliary pattern (as taught by either Kamon or Steinberg et al.) formed at the center of the unetched transparent 0° region of width A (shown by Ham), for the same reason as indicated above (*instant claim 20*).

Response to Arguments

Applicants' arguments in the current 2/29/08 amendment with respect to claims 2-12 and 14-20 have been considered, but they are either moot or unpersuasive in view of the newly revised ground(s) of rejection (as necessitated by the current amendment) and the objections set forth above in this Office action.

Responses to Applicants' current arguments are presented after the first rejection or objection to which they are directed. Rejections or objections of the previous Office action not found above are withdrawn in view of the current amendment and accompanying remarks.

Conclusion

Applicants' amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicants are reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to John Ruggles whose telephone number is 571-272-1390. The examiner can normally be reached on Monday-Thursday and alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Huff can be reached on 571-272-1385. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Jsr

/Mark F. Huff/
Supervisory Patent Examiner, Art Unit 1795